



PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

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|------------------------------------------------------------------------------|-----------------------------------------------------------------|-----------------------------------------------------|
| Applicant's or agent's file reference JBS-40-PCT | FOR FURTHER ACTION | See Form PCT/IPEA/416 |
| International application No. PCT/JP2004/007775 | International filing date (day/month/year) 28.05.2004 | Priority date (day/month/year) 30.05.2003 |
| International Patent Classification (IPC) or national classification and IPC | | |
| Applicant BRIDGESTONE CORPORATION | | |

| | | |
|----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. | This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36. | |
| 2. | This REPORT consists of a total of <u>6</u> sheets, including this cover sheet. | |
| 3. | This report is also accompanied by ANNEXES, comprising: | |
| a. | <input checked="" type="checkbox"/> (sent to the applicant and to the International Bureau) a total of <u>1</u> sheets, as follows: | |
| | <input checked="" type="checkbox"/> | sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions). |
| | <input type="checkbox"/> | sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box. |
| b. | <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) | |
| | _____, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions). | |
| 4. | This report contains indications relating to the following items: | |
| | <input checked="" type="checkbox"/> | Box No. I Basis of the report |
| | <input type="checkbox"/> | Box No. II Priority |
| | <input type="checkbox"/> | Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability |
| | <input type="checkbox"/> | Box No. IV Lack of unity of invention |
| | <input checked="" type="checkbox"/> | Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement |
| | <input type="checkbox"/> | Box No. VI Certain documents cited |
| | <input type="checkbox"/> | Box No. VII Certain defects in the international application |
| | <input type="checkbox"/> | Box No. VIII Certain observations on the international application |

| | |
|-----------------------------------------|-----------------------------------|
| Date of submission of the demand | Date of completion of this report |
| Name and mailing address of the IPEA/JP | Authorized officer |
| Facsimile No. | Telephone No. |

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/JP2004/007775

Box No. I Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
 - ☐ This report is based on translations from the original language into the following language _____, which is the language of a translation furnished for the purposes of:
 - ☐ international search (Rule 12.3 and 23.1(b))
 - ☐ publication of the international application (Rule 12.4)
 - ☐ international preliminary examination (Rule 55.2 and/or 55.3)
2. With regard to the elements of the international application, this report is based on (*replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report*):
 - ☐ the international application as originally filed/furnished
 - ☒ the description:
 - pages 1-32 _____ as originally filed/furnished
 - pages* _____ received by this Authority on _____
 - pages* _____ received by this Authority on _____
 - ☒ the claims:
 - nos. 2, 3, 5-39 _____ as originally filed/furnished
 - nos.* _____ as amended (together with any statement) under Article 19
 - nos.* 1 _____ received by this Authority on 14.12.2004
 - nos.* _____ received by this Authority on _____
 - ☒ the drawings:
 - sheets fig. 1-11 _____ as originally filed/furnished
 - sheets* _____ received by this Authority on _____
 - sheets* _____ received by this Authority on _____
 - ☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.
3. ☒ The amendments have resulted in the cancellation of:
 - ☐ the description, pages _____
 - ☒ the claims, nos. 4 _____
 - ☐ the drawings, sheets/figs _____
 - ☐ the sequence listing (*specify*): _____
 - ☐ any table(s) related to sequence listing (*specify*): _____
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
 - ☐ the description, pages _____
 - ☐ the claims, nos. _____
 - ☐ the drawings, sheets/figs _____
 - ☐ the sequence listing (*specify*): _____
 - ☐ any table(s) related to sequence listing (*specify*): _____

* If item 4 applies, some or all of those sheets may be marked "superseded."

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/JP2004/007775

Box No. V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

| | | | |
|-------------------------------|--------|-----------|-----|
| Novelty (N) | Claims | 1-3, 5-39 | YES |
| | Claims | | NO |
| Inventive step (IS) | Claims | | YES |
| | Claims | 1-3, 5-39 | NO |
| Industrial applicability (IA) | Claims | 1-3, 5-39 | YES |
| | Claims | | NO |

2. Citations and explanations (Rule 70.7)

Document 1: JP 2002-255693 A (Bridgestone Corp.), 11
September 2002

Document 2: US 2002/0083891 A1 (Vodakov et al.), 04 July
2002

Claim 1 does not involve an inventive step in the light of documents 1 and 2. Document 1 discloses a method for producing single crystals of silicon carbide by disposing seed crystals and a material for sublimation at positions opposite each other within a reaction container. In addition, the feature of providing the seed crystals upon a sealed member is disclosed in document 2; therefore, it can be said to have been easy for a person skilled in the art to conceive of employing the well-known technical feature in question. Furthermore, it would have been easy for a person skilled in the art to set the size and the form of the seal part so as to ensure that the seal that is formed thereby is reliable.

Claims 2 and 3 do not involve an inventive step in the light of documents 1 and 2. It can be said to have been easy for a person skilled in the art to determine what material to configure the seal part from with consideration of the strength of the seal.

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/JP2004/007775

| | |
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|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|

Claims 5 to 10 do not involve an inventive step in the light of documents 1 and 2. It would have been easy for a person skilled in the art to delimit what forms the single crystals of silicon carbide will take when grown upon the seed crystals.

Claims 11 to 16 do not involve an inventive step in the light of documents 1 and 2. Document 1 discloses the feature of providing a means for heating the sublimation material section and a means for heating the seed crystal section when producing single crystals of silicon carbide by growing a sublimation material upon seed crystals. In addition, it can be said to have been easy for a person skilled in the art to set the amounts of heat that are generated by the respective heating means with consideration of the growth of the single crystals of silicon carbide.

Claims 17 to 19 do not involve an inventive step in the light of documents 1 and 2. Document 1 discloses the feature of providing an interference prevention coil.

Claims 20 to 22 do not involve an inventive step in the light of documents 1 and 2. It would have been easy for a person skilled in the art to determine what material to configure the reaction container and the crucible from.

Claims 23 to 29 do not involve an inventive step in the light of documents 1 and 2. Document 1 discloses the feature of configuring the material for sublimation from a silicon carbide powder that was obtained by using an alkoxysilane polymer as the silicon source and by using an organic compound that generates carbon when subjected to heat as the carbon source.

Claim 30 does not involve an inventive step in the

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/JP2004/007775

Box No. V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability;
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light of documents 1 and 2. It would have been easy for a person skilled in the art to delimit the purity of the silicon carbide that serves as the material for sublimation.

Claims 31 to 33 do not involve an inventive step in the light of documents 1 and 2. The methods for the production of single crystals of silicon carbide which are set forth in claims 5 to 30 do not involve an inventive step in the light of documents 1 and 2; therefore, the single crystals of silicon carbide that are obtained by means of the production methods in question cannot be said to involve an inventive step in the light of documents 1 and 2 (furthermore, document 1 also discloses the features of configuring so that there are not more than 100 hollow pipe-shaped crystal defects per square centimeter, and configuring so that the total impurity content is not more than 10 ppm).

Claims 34 to 36 do not involve an inventive step in the light of documents 1 and 2. Document 2 discloses a device for producing single crystals of silicon carbide while preventing the leakage of the material for sublimation by disposing the seed crystals and the material for sublimation within a reaction container and then sealing the reaction container. In addition, it can be said to have been easy for a person skilled in the art to determine what material to configure the seal part from with consideration of the strength of the seal.

Claim 37 does not involve an inventive step in the light of documents 1 and 2. Document 1 discloses the feature of providing a means for heating the sublimation material section and a means for heating the seed crystal section when producing single crystals of silicon carbide

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/JP2004/007775

Box No. V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability;
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by growing a sublimation material upon seed crystals.

Claims 38 and 39 do not involve an inventive step
in the light of documents 1 and 2. Document 1 discloses
the feature of providing an interference prevention coil.